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United States Department of Agriculture
EXTENSION SERVICE
Washington, D. C.

METHODS OF DEVELOPING A SOUND PASTURE-IMPROVEMENT PROGRAM

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The four papers given in this mimeograph were read
at the Conference of Extension Agronomists at the meeting
in Chicago, December 4, 1939.

This meeting was held in connection with the 20th
meeting of the International Crop Improvement Association.

There was presented with these papers a consider-
able amount of material that is being used in each State
in the conduct of its pasture improvement program. Any-
one interested can secure copies of this material direct
from each State.

Very truly yours,

O. S. Fisher

O. S. Fisher
Extension Agronomist

Attachments.

PASTURE IMPROVEMENT BY FERTILIZATION AND SEEDING

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The pasture situation in Indiana presents the usual problems of the eastern Corn Belt. Farmers depend on permanent pastures, supplementary rotation pastures, and to a small extent on emergency pastures. As a rule, all are inadequate to meet the livestock needs. The permanent pastures may grow vigorously in the spring, very little during high mid-summer temperatures, and a little more in the fall. Heavy grazing practiced on many permanent pastures with very little fertility return in the form of manure or commercial fertilizers results in the impoverishment of the grass, and the once luxuriant Kentucky bluegrass gives way to Canadian bluegrass and this to annual and less valuable grasses and weeds. The importance of fertilizing pastures has been pointed out for many years; but, as a common farm practice, pasture fertilization lags far behind grain and corn fertilization practices. To show the results of pasture fertilization, demonstration plots showing results of various treatments under farm conditions were established in 1931. Strips 1 rod wide and 10 rods long receive specific treatment. These strips run at right angles to a fence along the field, and a temporary fence was erected to exclude the livestock from an area 1 rod square of each treatment. Untreated check plots, a phosphate plot, a phosphate-potash plot, and a complete fertilizer plot were included in such demonstrations; and usually manure and manure-fertilizer plots were added. The extensiveness of the layout depended upon the interest of the county agent and the cooperating farmer. Limestone was applied on all plots according to the acidity of the soil.

Comparisons of the amount of growth in the ungrazed plots were made at field meetings conducted in the late spring. Yields of grass were determined by clipping and weighing the grass from small areas under each treatment in late May. Results from 14 demonstrations carried on in 1931 and 1932 shows that 400 pounds of 20-percent superphosphate increased the weight of dry grass 70 percent, that 500 pounds of 0-16-10 increased the weight of dry grass 145 percent, and that the addition of 150 to 200 pounds of nitrogen carrier to the phosphate and potash increased the weight 214 percent above the untreated plots.

Especially outstanding was the effect on the proportion of wild white clover. Phosphate apparently stimulated it, and with no reseeding the stand of rejuvenated white clover outlined many phosphate plots; thus the desirable nitrogen relationship was re-established, which, of course, was invigorating to the nitrogen starved grass.

A study of the average results for the 3 years 1931, 1932, and 1933 indicates that positive responses are assured on practically all soils from the use of superphosphate or nitrogen. The response from limestone depended upon the degree of acidity.

From a number of fertilizer demonstrations conducted on permanent pastures on the light-colored soils it has been shown that the first need is an application of at least 1 ton of limestone. The second need is phosphorus. An application of 300 to 400 pounds per acre of superphosphate should be applied. Such a treatment will serve for about 4 years for the superphosphate and 10 to 15 years for the limestone and will usually double the carrying capacity of the pastures and increase the protein content through the volunteering of legumes. The annual cost of such treatment is very reasonable and on such soils should prove very profitable if properly utilized.

In these tests the addition of nitrogen in the fertilizer treatment has increased the protein content of the grass, on a drymatter basis, from 1 to 2 percent on the average. This increase will vary with the soil, the kind of grass or legume-grass mixture, and the season.

In general, the grass on the fertilized plots proved more palatable to livestock, produced a stronger turf, and contained fewer weeds.

Residual effects during following years were measured in some cases.

Light applications of superphosphate have seemed relatively ineffective and certainly less enduring in stimulating these worn pastures. Because results are difficult to see, applications of 300 to 400 pounds of superphosphate per acre are usually the minimum.

One demonstration laid out to compare different amounts of phosphate is reported. The test was conducted on an old permanent pasture made up principally of Canada and Kentucky bluegrass and containing occasional broomsedge plants. The soil on this field, according to quick soil tests, was very low in available phosphorus and needed 2 tons of limestone per acre.

The various plots were harvested five times in ungrazed areas. Where the growth reached 5 inches it was reduced to 2 inches with an adapted lawn mower. One-thousandth of an acre was harvested from each plot, the samples weighed green, and again when thoroughly air dry.

Superphosphate (20 percent) was applied at rates of 100 to 800 pounds per acre. All fertilizers were applied by hand on March 26. Inconsistencies in yield between different rates of fertilizer applications occurred early in the season, but on the last harvest the increases were consistent throughout. Observation tended to indicate an even greater variation in growth than actual yields indicated. White clover increased in growth directly with the progressive amounts of superphosphate. Existing bluegrass responded to treatment on all plots along with the clover. The higher-yielding plots had noticeably less broomsedge at the end of the season than the check or lower yielding plots. On the average there were successively increasing responses to the graduated amounts of phosphate applied, and this difference became more pronounced as the season progressed. The addition of potash to superphosphate produced no additional increase during the first season.

Results of Rate of Application of Superphosphate
on Permanent Pasture*
Lawrence County - 1937
Bedford and Lawrence Silt Loam

Treatment	Green	Dry	Increase
	Weight Per Acre	Weight Per Acre	
	<u>Pounds</u>	<u>Pounds</u>	<u>Percent</u>
Limestone - 2 tons.....	1047.6	388.7	---
Limestone and superphosphate - 150 lbs. 0-20-0.....	1702.6	608.2	42.2
Limestone and superphosphate - 350 lbs. 0-20-0.....	2614.5	828.8	71.2
Limestone, superphosphate 700 lbs.	3854.3	1051.2	107.8
Limestone.....	1448.3	526.9	---
Limestone, superphosphate - 400 lbs. 0-20-0 and potash - 100 lbs. muriate.....	2571.3	720.0	38.2
Limestone.....	1298.9	496.9	---

*Conducted in cooperation with the Leatherwood Project, Soil Conservation Service.

(From Purdue University Agricultural Extension Bulletin No. 205.)

Demonstrations have been laid out on good grass pasture in central Indiana. The response under extremely favorable conditions for grass have been nil, but such pastures are rare; and as a rule most check plots will benefit from a resting period, usually show a thicker sod, and are more free from weeds than the grazed portion.

Spread of practice is directly tied up with the amount of demonstrating but it is beginning to show in counties where the most pasture-improvement work has been done. Pasture-improvement and pasture-program contests are being tried out in a few counties. A research man has been added to the staff of the experiment station to study pasture improvement, and in the last few years demonstration work on pasture rejuvenation has been started. A demonstration to show the importance of fertilization and to speed up the practice has been outlined because of the common fallacious idea that disking an old pasture and reseeding it are the two essential steps in its restoration. Consequently, one part of an old pasture is given that sort of treatment while immediately adjacent similar treatment is followed, supplemented with an adequate supply of fertilizer. Legumes adapted to the particular soil and region are included in the reseeding. More than half the Indiana counties carried on demonstration work in 1939 and used either the fertilizer or rejuvenation demonstration.

In rotation pasture improvement, the use of a mixture of adapted legumes and one or two grasses is becoming rather widespread. Such a mixture gives more assurance of success following seeding than dependence on one legume and one grass. Sudan-grass acreage is growing steadily for emergency pasture use. Cooperation of the various departments interested in pasture use, management, or improvement is resulting in widespread interest in pastures.

PASTURE IMPROVEMENT IN THE SOUTH

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Early in November of 1939, the following request for information on permanent improved pastures was sent to the extension agronomists of the South:

1. List the following items in the order of their importance in your State: (a) seeding, (b) cultivating, (c) mowing, (d) contour terracing, (e) controlled grazing, (f) fertilizing, and (g) rotation.
2. What would you consider the limit of profitable expenditure per acre on dairy pastures? Beef pastures?
3. Can all soil types be converted into profitable grazing lands?
4. How long does it take an improved pasture, on the average, to reach maximum production?
5. Should the pasture improvement program of a State, from an extension standpoint, be determined by the agronomist, or can a better job be done by an extension forage-livestock committee?
6. Give a brief outline of your extension pasture program.
7. List a few of the more important research problems needing attention in your State.

Complete replies to this questionnaire were received from Tennessee, Virginia, Mississippi, Alabama, Arkansas, Texas, and Georgia giving a fairly good cross section of the situation for the South.

PASTURE IMPROVEMENT PRACTICES ARRANGED IN ORDER OF THEIR IMPORTANCE BY STATES

Practice	Tennessee	Virginia	Mississippi	Alabama	Arkansas	Texas	Georgia	Louisiana
Seeding	2	1	4	1	2	3	1	4
Cultivating	7	6		6	6	7	6	
Mowing	4	2	3	1	3	4	1	1
Contour terracing	5		7		5	7	6	2
Controlled grazing	3	3	2		5	1	5	5
Fertilizing	1	1	2	3	6	3	2	3
Rotation	6		5		7	4	5	7

↑ East of Blue Ridge

↓ West of Blue Ridge

This tabulation indicates that mowing and fertilizing are of first importance and are about equal in value. Seeding is also of great importance and ranks third. The remaining practices in the order of their importance are controlled grazing, contour terracing, rotation, and cultivation.

The indications are that for dairy farming an expenditure up to \$15 per acre might be profitable. Beef cattle farming being a more extensive enterprise would not probably justify an expenditure exceeding \$10 per acre for pasture improvement.

It was unanimously agreed that some soil types could not be converted into profitable improved pasture.

The lowest estimate on the length of time it takes a newly seeded and treated, improved pasture to reach maximum production was 3 years, the longest time, 5 years. The average time would appear to be about 4 years.

Research information is needed by most of the States on such matters as adapted pasture plants and their composition, proper fertilization, effective weedcontrol measures, contour terracing, and controlled grazing.

Because pasture production and utilization are so closely related, all the States agree that a pasture-livestock committee is essential for a sound forage program.

MISSOURI PASTURE CONTEST

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The Missouri pasture contest was started in 1932 through the cooperation of the Agricultural Extension Service and the Kansas City Chamber of Commerce. For the first 2 years it was conducted only in western Missouri; but in 1934, through the added cooperation of the St. Louis Chamber of Commerce, it was made State-wide. For the first 4 years it was based primarily on the improvement made in permanent pastures and the management of and returns from livestock produced on pasture. In 1934 and 1935 cash prizes were given to counties in addition to the medals awarded to farmer contestants. In 1936 supplementary pastures were added. In 1939 the effect of the whole farming system upon fertility and erosion and the returns in the form of livestock and livestock products from feeds produced on the farm to supplement pastures were included. Cash awards have always been made direct to the

farmer contestants except in 1933, 1934, and 1935 when medals only were given them. In 1936, in order to equalize competition between contestants as much as possible, the State was divided into seven sections on the basis of type-of-farming areas. Since then all awards have been made on the basis of these districts.

All the cash and medals used in making the awards have been furnished by the Kansas City and St. Louis chambers of commerce. In 1932, \$500 was furnished by the Kansas City Chamber of Commerce to be divided among contestants in the western half of the State as follows: First, \$100; second, \$75; third, \$50; fourth, \$40; fifth, \$35; sixth and seventh, \$25 each; eighth and ninth, \$20 each; tenth, eleventh, twelfth, and thirteenth, \$15 each; and fourteenth, fifteenth, and sixteenth, \$10 each.

In 1933 gold medals instead of the cash prizes were awarded by the Kansas City Chamber of Commerce to the 10 farmers in western Missouri who demonstrated the best management of their permanent pastures during the year. In 1934 and 1935 the Kansas City and St. Louis chambers of commerce donated jointly \$500. This was to be used for purchasing 10 gold medals used as awards to the 10 farmers in the State who carried out the best pasture management and pasture improvement programs during the year and for cash prizes to the counties. These cash awards were made to the counties as follows: First, \$100; second, \$80; third, \$70; fourth, fifth, and sixth, \$50 each; and seventh, eighth, ninth, and tenth, \$25 each.

Since 1934 the Kansas City and St. Louis chambers of commerce have continued to donate jointly \$500 each year to be used as prize money. From 1936 up to the present time \$470 of this has been used for cash prizes to individual farmers making the best showing in each of the seven districts of the State. The remaining \$30 has been used for the purchase of a silver trophy, such as a silver water service, serving tray, or some other appropriate or useful gift appropriately engraved for the State winner in addition to the cash prize which he, of course, always receives as a district winner. Three individual cash prizes are awarded in each of the seven districts as follows: First, \$30; second, \$22.50; and third, \$15.

For the first 2 years of the contest, and for the second 2 years in the first division of the State, the score which was used in determining the ranking of the entrants was based on permanent pasture improvement including (1) variety of grasses and legumes and density of turf; (2) the management of the pasture, including the amount of stock carried and the control of weeds and brush; and (3) the cost of improving this pasture and the extent or amount of the improvement made. In division 2, the contest in 1934 and 1935 was designed to fit into the plan for increasing the acreage of permanent pasture on contracted acreage as provided in the AAA program. The score card for the second division of the contest during these 2 years was based on (1) the general management and improvement of the permanent pasture acreage in the county; (2) the percentage of farmers in the county seeding five or more of their contracted acres to permanent pasture; (3) the percentage of all contracted acres in the county seeded to permanent pasture, and (4) the methods generally used that would add to the success of getting stands of

grasses and legumes; such as efficient preparation of the seedbed, using adapted seeds, and following recommended fertilizer practices.

In 1936, 1937, and 1938, the score of each contestant was based on (1) the amount of pasturage secured from both the permanent and supplementary pastures on the whole farm; (2) the condition of the permanent pasture; (3) the efficiency of the whole pasture system, including the supplementary pasture, in the control of soil erosion; (4) the effect of the pasture system upon soil fertility including the acreage of legumes used, care and use of barnyard manure, and amount of agricultural limestone and commercial fertilizers used; and (5) the balance of the pasture system as it relates to the entire farm on the basis of producing the pasture needed by the livestock.

In 1939 each entrant's score was based on his efficiency in (1) the production of livestock and livestock products as determined by the amount of feed grown and the records of gain on all livestock on the farm and the amount of livestock produced, (2) the maintenance of soil productivity and erosion factors as explained in Missouri Experiment Station Bulletin No. 405, and (3) the entrant's efficiency in supplying and utilizing the pasture needed by the livestock. The first and third points in this score card were obtained from the records kept on the "Pasture, Feed and Livestock Production Summary" form, and a work sheet for determining the productivity and erosion balance was provided in determining the second point in this score.

This contest since its beginning has been under the general supervision of a State committee consisting of one representative each of the Kansas City and St. Louis chambers of commerce and one representative each from the extension projects in field crops, animal husbandry, soils, and, during the last two years, soil conservation. The contest in each individual county has been under the local supervision of a county committee of three, approved and appointed each year by the director of the Agricultural Extension Service. It is the duty of the county committee to visit and score the farms of the entrants and to determine the highest ranking individuals in the respective counties. After this is done, the records are sent to the State committee for final decision. Before this final placing is made, visits are usually made by one or more members of the State committee to the farms of the highest ranking contestants in order to be sure that the placings of both the State committee and county committees agree.

Since the contest was placed on a district basis in 1936, the county committees pick out the three highest ranking entrants in their respective counties, and the farms of these are visited by one or more members of the State committee for the purpose of deciding upon the district and State winners. Since 1936 no individual county prizes except certificates, awarded in 1938 and 1939, have been offered by the Kansas City and St. Louis chambers of commerce. Local or county prizes by civic organizations and chambers of commerce, have been encouraged, however, and in 1938, six counties provided, through some local means, county prizes for their three highest ranking contestants. There has been a slight increase this year in the number of counties offering these local prizes.

As the contest has progressed, it has become more inclusive until now it not only includes the whole farm from the standpoint of controlling erosion and maintaining soil fertility but also how efficiently the farmer produces the feeds needed by his livestock in addition to the pasture produced and how well he utilizes the feeds for the production of livestock and livestock products. This complicates the contest considerably and makes a great deal more work for those involved in it. From a long-time basis, however, the success of a pasture program as well as most any other program followed on the farm in Missouri is going to depend on how efficiently the farmer can produce the feed needed by his livestock and how well he can utilize this feed for the production of livestock and livestock products and, at the same time maintain his basic resource, the soil, through the control of erosion and by following practices that will maintain the productivity of the land.

The following table which includes the number of entries for each year of the contest will give some idea of the growth in interest apparent even though the contest itself has become more inclusive, and increasingly complicated and difficult in recent years.

<u>Year</u>	<u>Counties</u>	<u>Entries</u>
1932	12	58
1933	12	48
1934	12	58
1935	9	41
1936	10	65
1937	26	144
1938	29	168
1939	44	239

NEBRASKA PASTURE-FORAGE-LIVESTOCK PROGRAM

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The Nebraska pasture-forage-livestock program in its entirety would not necessarily fit the agricultural needs in most States. Because conditions in Nebraska have changed so much during the past 6 years from what they were prior to that time, special problems have arisen. Some of the neighboring States have experienced similar conditions, but in most other sections of the country the amount of rainfall has remained more nearly constant. That makes the pasture, forage, and livestock problems in Nebraska different from those in most other sections. Neither is this program the answer as far as an ideal educational project is concerned. The program as it has been carried out has

definite advantages. Likewise it has some shortcomings. Both are evident as the project is considered in detail.

The present program is an outgrowth of the old Nebraska pasture contest. This original program was initiated by P. H. Stewart, then extension agronomist in Nebraska, D. L. Gross, and others. It was formulated to take care of an emergency situation. The extreme drought of 1934, together with overgrazing, resulted in serious deterioration of Nebraska pastures. Particularly in eastern Nebraska where bluegrass had largely replaced the more drought-resistant native grasses, the damage was severe. It was estimated that 75 percent of the grasses in pastures was "killed out". In some counties the damage ran as high as 90 percent. Farther west, due to the dominance of such drought-resistant grasses as blue grama, buffalo grass, and others, the damage was not as extensive, but everywhere pastures deteriorated.

The pasture contest was chosen as the best means of calling attention to the seriousness of the pasture situation, gathering pasture information, and disseminating recommended practices among farmers. It was sponsored by the Agricultural College Extension Service, the Omaha Chamber of Commerce, the Nebraska Crop Growers' Association, and the Nebraska Livestock Breeders' Association.

From an educational standpoint, this project could well be termed successful through its 3 years of existence. But unfavorable climatic conditions continued and except for very limited areas, pasture seedings resulted in failures. Pastures suffered further deterioration through the severe drought of 1936. Much money had been spent for seed, there was practically no subsoil moisture, and grasshoppers were threatening as we surveyed the 1938 growing season during the previous winter. Nebraska livestock numbers were dwindling. But temporary pastures and forage crops could take the place of permanent pastures. With increased usage of these crops, livestock numbers could be maintained and even increased. Sorghums needed popularization not only to provide roughage but also grain. Reserve feeds, particularly as carried over in trench silos, offered one of the best means of stabilized livestock production.

Then too, increased hay and pasture production was receiving emphasis from the various governmental agencies. The Agricultural Conservation Program and the Soil Conservation Service, particularly, were asking for additional land to be seeded down to soil conserving crops. It has been estimated by those working on land use that in excess of 2 million acres of land used for crop production in the State of Nebraska should permanently be returned to grass. With this emphasis on pasture and hay production, with the vital need of raising forage to make livestock production possible, and with so many agencies, especially civic ones, anxious to cooperate in an agricultural program, the time was opportune for launching a large-scale project.

Because of these special conditions, the old pasture contest was renamed the pasture-forage-livestock program and broadened to include the following objectives:

1. Produce high-quality roughage.
2. Restore pastures.
3. Return eroded land to grass.
4. Increase acreage of soil-building crops.
5. Maintain proper livestock-forage balance.
6. Utilize forage crops profitably.
7. Build up feed reserves.
8. Encourage livestock on tenant farms.

Specifically, the same cooperation agencies with sponsored the pasture contest continued in charge of this program. Regionally and locally, numerous civic groups assisted in sponsoring the project. In a more general way, all agencies interested in betterment of Nebraska agriculture have supported the program.

One of the biggest difficulties in conducting this program has been to keep it restricted to the original objectives. Naturally in its broader aspects it points towards an all-round balanced farming program. Those of us working closely with it, however, have attempted to adhere to the original aim, that of providing ample high-quality pasture and forage and its profitable utilization. Much emphasis has been given to feed conservation.

Methods

Instead of giving details of past programs, only the procedure for 1939 is given here. Immediately following the State finish-up meeting climaxing the year's activities of the 1938 pasture-forage-livestock program, Director W. H. Brokaw called a meeting of all specialists to make suggestions for continuation of the program in 1939. A committee was appointed to work out details and to take charge of the program during the remainder of the year. This committee was composed of Walter Tolman, assistant extension animal husbandman; George Round, extension editor; and myself. This committee met frequently during the remainder of the year and worked very closely together on details of the program. From time to time, progress was reported to other extension specialists at conferences. Any major decisions and matters of policy were left to the extension specialists as a group.

A printed circular announcing details of the program and containing some subject matter was drawn up. Orders were taken from county agricultural agents for distribution. About 80,000 copies of this publication were distributed. Amount of coverage can be seen from the fact that there are approximately 125,000 farmers in the State of Nebraska.

A 41-page handbook was assembled for the use of county agricultural agents in carrying out the program. Material for this handbook was submitted by the following subject-matter departments: Agronomy, animal husbandry, dairy husbandry, publicity, agricultural economics, agricultural engineering, and poultry husbandry. At a series of county agent conferences held during the month of February, agents were familiarized with material given in the handbook. The various forms used in the project were explained.

Immediately following the county agent district conferences, county agricultural agents began the work of making out "balance sheets" or forms used to enroll cooperators in the project. This so-called "balance sheet" was really a budget plan showing feed needed for livestock and how it was to be provided. The number of cooperators per county ranged from none in a few counties to 78 in the county with the highest number. For the 83 counties and county agent districts, approximately 1,600 cooperators were enrolled in the pasture-forage-livestock program. Following the making out of the balance sheet, cooperators were furnished with a rather simple summer record form to be kept by them during the summer.

Various county and district meetings were held to acquaint farmers with information involved in the project. Special district meetings were held with farmers, bankers, Farm Security Administration representatives, and others to consider practical means of planning sound livestock programs on individual farms. One of the outstanding farmer meetings held in connection with the project was a sorghum-livestock field day at Franklin in the south central part of the State on March 9. Over 1,000 people were in attendance.

During the month of June, county agricultural agents made a second visit to each cooperator. A special form known as the "summer check sheet" was filled out by the agent for each cooperator after visiting him. Where desired, help was given the cooperator in bringing his summer record form up to date.

During the early part of October, county agricultural agents were sent samples of two types of final report forms and told they could use whichever they wished in completing work with cooperators in their respective counties. One form was rather long and involved. It was known as the "complete final report." The information gathered through it will permit summarization for such factors as carrying capacities of different kinds of pastures, costs of furnishing pasture through various crops, and returns from pastures as compared to other crops. The other form known as the "abbreviated final report" provided chiefly for the selection of cooperators for recognition. It was sufficiently detailed to enable the agent to get a good complete story from the cooperator but will permit relatively little summarization for the factors mentioned above. Approximately 30 counties elected to use the complete final report.

Counties were instructed to get their final reports completed by a certain date. Then representatives of the State office were scheduled to go into each county for one day to help select cooperators for county and possible district and State recognition. This was done by going over all completed records in the county office and then visiting the several outstanding cooperators in the county.

Results

Following selection of cooperators for recognition, county, district, and State recognition meetings were held. As the State finish-up meeting was held in Omaha, at the extreme eastern end of the State, four district meetings covering the western half of the State were set up to take care of the many

cooperators who were unable to attend the State meeting. These meetings were sponsored by the Extension Service and the civic organizations in these areas. A total of 1,100 farmers and business men attended the district meetings. In addition, the Sioux City Chamber of Commerce in cooperation with the Extension Service of the Iowa State College held a recognition meeting at that point which included a few northeastern Nebraska counties.

The State recognition meeting was held at Omaha on November 28. It consisted of a morning feeder and market livestock demonstration put on in cooperation with the Omaha livestock interests. This new feature of the State finish-up meeting proved particularly popular. It was followed by a free lunch given by the Union Stockyards Company of Omaha, Limited. The afternoon was given over to a pasture-forage-livestock clinic with talks by farmers, agricultural college men, and business representatives. In the evening, all cooperators present were honored at a banquet given by the Omaha Chamber of Commerce. Fifty-four cooperators were given special recognition. Each of the honored cooperators was introduced to the crowd by having him answer a few questions on his pasture-forage-livestock management practices. The 6 cooperators receiving outstanding recognition gave their practices in detail. The crowd at this State finish-up meeting was estimated at 800 with over 60 counties represented.

One of the most difficult things in the program has been to get results obtained by cooperators before more farmers. This year, help was offered counties in holding county pasture-forage-livestock tours. About 25 such tours were held. Director W. H. Brokaw took 1,200 feet of colored motion picture film on the farms of cooperators to illustrate good practices. The outline for these pictures was drawn up in the spring of the year and was made to illustrate the 8 points in detail. The film was shown for the first time at the State finish-up meeting, and plans are now under way to make the film available to all counties desiring it. It is thought that a county meeting where a few successful cooperators would report on their particular practices together with the showing of the pasture-forage-livestock motion pictures might prove attractive. County sorghum-topping contests and a State sorghum-topping contest in cooperation with the leading farm paper in the State, the Nebraska Farmer, were held as a means of reaching more people. At the State contest, exhibits were put up by several subject-matter departments. A question box on all phases of the sorghum problem proved particularly successful.

Publicity

The outstanding feature of the program has been the publicity gained through it. This program overshadows everything else we are doing in extension work in Nebraska from the standpoint of the space commanded in the daily papers, other periodicals, and on the radio during the time recognition meetings are being held. In fact, the publicity given the program has been excellent throughout the year. The Omaha World Herald, The largest daily paper in the State of Nebraska, published a special issue for cooperators on the evening of the State meeting. Another of the daily papers, the Nebraska State Journal, carried five pictures, running from the top two-thirds of the way down the front page, of cooperators at one of the regional

meetings. The Omaha Daily Journal-Stockman put out a special pasture-forage-livestock issue which was distributed to cooperators at the State meeting. One radio station carried the entire evening program at one of the district meetings. At the State finish-up meeting, two radio stations made special transcriptions, and two others ran 15-minute broadcasts from the meeting.

Accomplishments

Definite accomplishments and actual progress, as in much extension work, are difficult to measure. We know that the sorghum acreage (grain and forage) has been stepped up from 482,000 acres in 1934 to 1,563,000 acres in 1939. The wisdom of Nebraska farmers in switching to this more drought-resistant crop can readily be seen from the fact that out crop yields this year are only 40 percent of normal. Probably 90 percent of the farmers in eastern Nebraska are "sold" on bromegrass and will establish stands as soon as climatic conditions permit. The storage of feeds as a reserve for dry years has increased tremendously in popularity. Whereas, even 3 years ago few farmers were willing to accept sorghum grain as a standard livestock feed, this crop is almost universally accepted in the State today. Many elevators and feed mills are handling it.

From an intrinsic point of view, we believe much has been done to keep up the morale of people in the State. The "success" stories have been an inspiration to everyone. An especially valuable accomplishment has been the fine relationship made possible with businessmen over the State.